

2017 Central Valley Flood Protection Plan Update

February 25, 2015

Presented by:

Michael Mierzwa, P.E.

Michael.Mierzwa@water.ca.gov

Lead Flood Management Planner

California Department of Water Resources



2017 ROADMAP



Today's Discussion

Where We've Been

- Basin-Wide Feasibility Study: Atlases and Approaches

Where We Are

- DWR's RFMP Phase 1 Content Review

Where We're Going

- Long-Term OMRR&R Workgroup Overview



Where We've Been

Basin-Wide Feasibility Study Atlases and Approaches

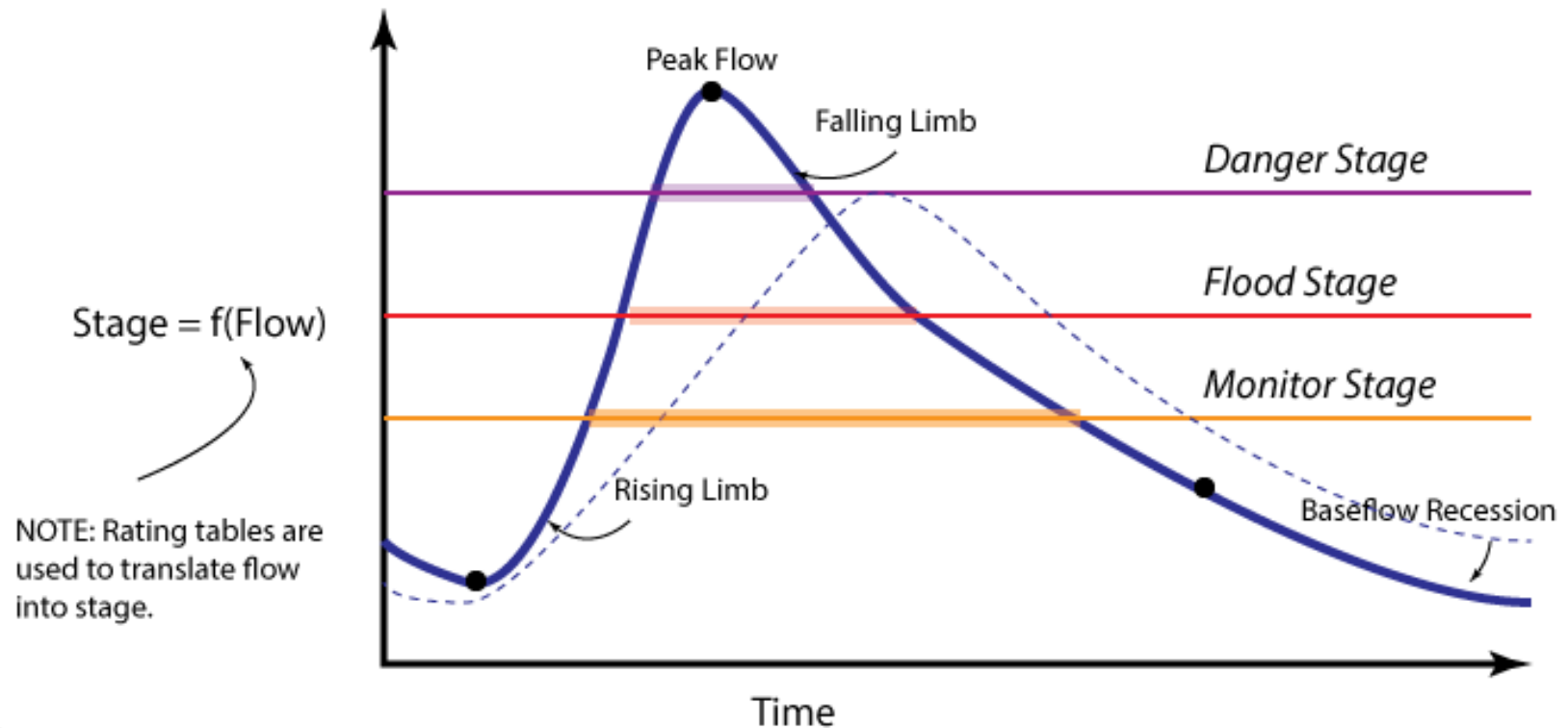
2017 CVFPP Update

Chapter 1 Context	Setting Historical Context
Chapter 2 Converging	Summary of Refinements and Areas of Alignment
Chapter 3 System Management	Strategies to Improve System Management
Chapter 4 Implementation Timing	Investment Approach
Chapter 5 Measuring Value	Tracking, Reporting of Investment Actions & Results

Managing for Stage

'Stage' is the elevation of flood water surface at any given location

CONCEPT: Although hydrologists track flow, we still manage our system for stage.



Basin-Wide Feasibility Study Atlases

Chapter 3

System Management

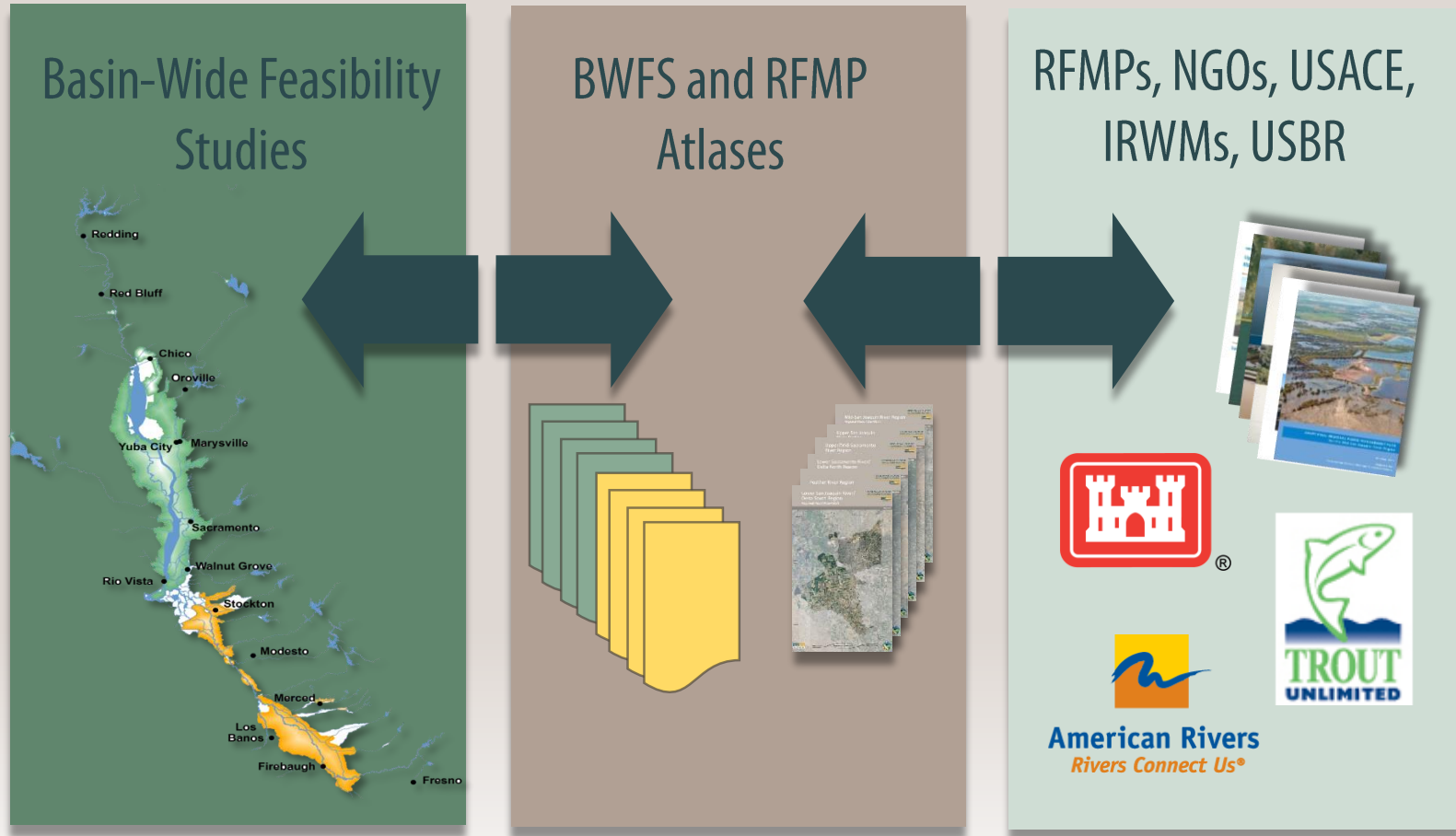
- Living documents linking system performance to geospatial data
- Tools to identify a range of maximum flows that can be safely conveyed through each of the State Plan of Flood Control bypass systems
- Estimate 100- and 200-year peak flows
 - Using the Central Valley Hydrology Study (CVHS) hydrology, without climate change
 - Results compared to USACE 1957 design flows and design profiles
- Demonstrate potential performance of system based on key assumptions and initial configurations

Why Do We Need Atlases?



- California's current flood system design based on limited experience
- No consideration of rise/recession of water levels
- Atlases illustrating system performance help us refine how we see our collective efforts working in tandem
- Must account for hydrologic variability when planning to manage future flood events

Companion Studies and Efforts



Preliminary Basin-Wide Feasibility Study Approaches

Sacramento River Basin

- Fix-in-Place Approach
- Build Storage to Store Peak Flood Flows Approach
- Expand and Extend Bypasses to Increase Conveyance Capacity of the Flood Management System Approach

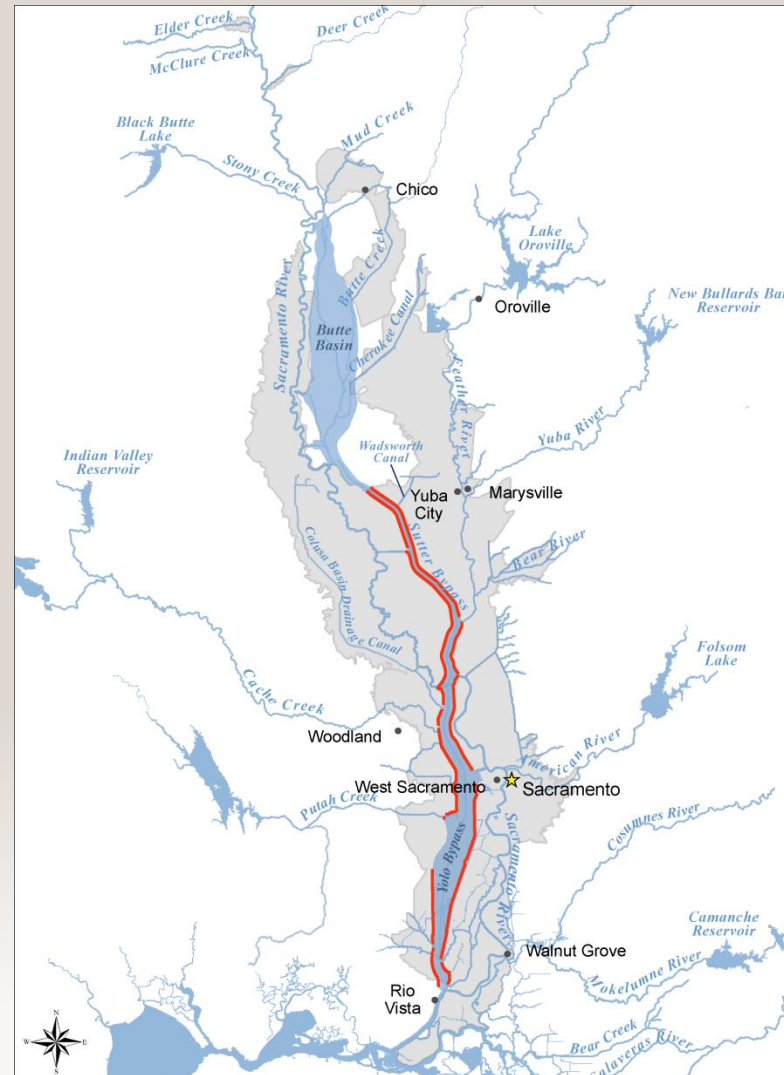
San Joaquin River Basin

- Paradise Cut Bypass Approach
- Floodplain Transitory Storage Approach
- Raise and Fix-in-Place Levee Approach
- Upstream Storage Approach

Sacramento Basin

Fix in Place Approach

- Strengthen and raise levees **along bypasses** to convey 100-year flow (or 200-year flow if urban levee)
- Achieve and maintain 200-year and 100-year level of protection with projected sea level rise and climate change

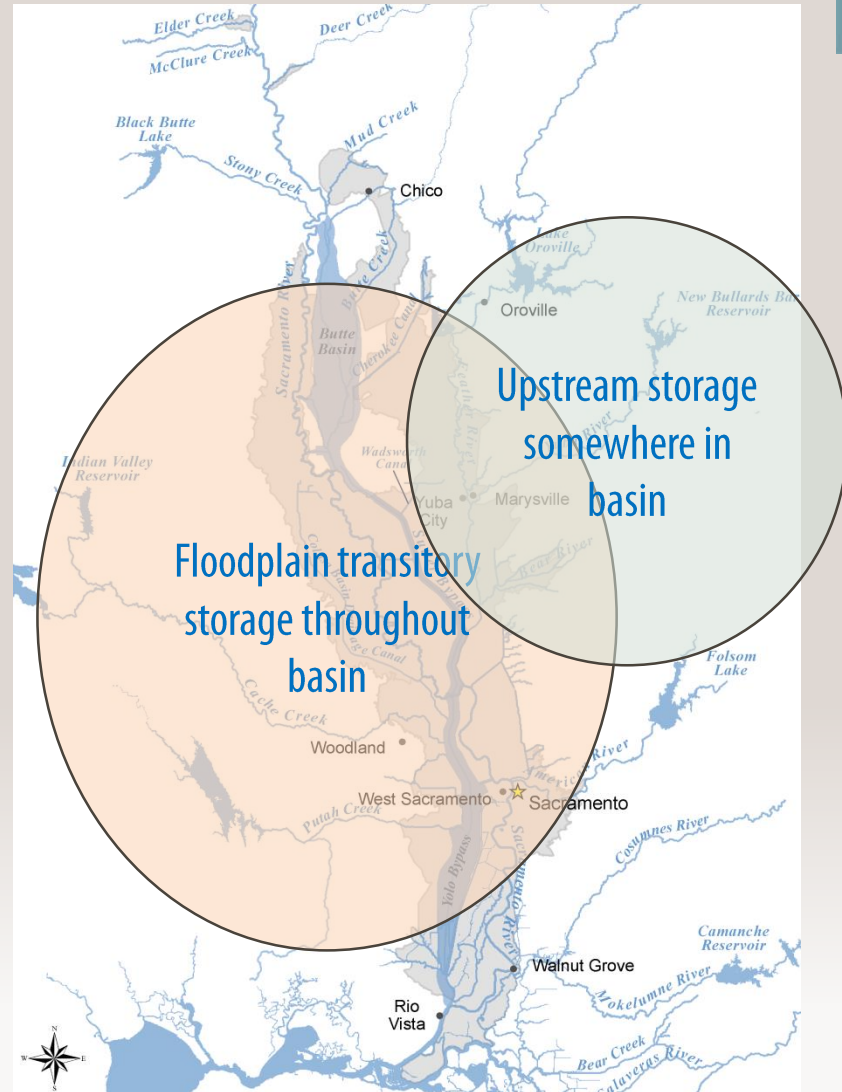


Sacramento Basin

Build Storage to Store Peak Flood Flows Approach

Either upstream storage or transitory storage to address projected climate change, as willing participants arise:

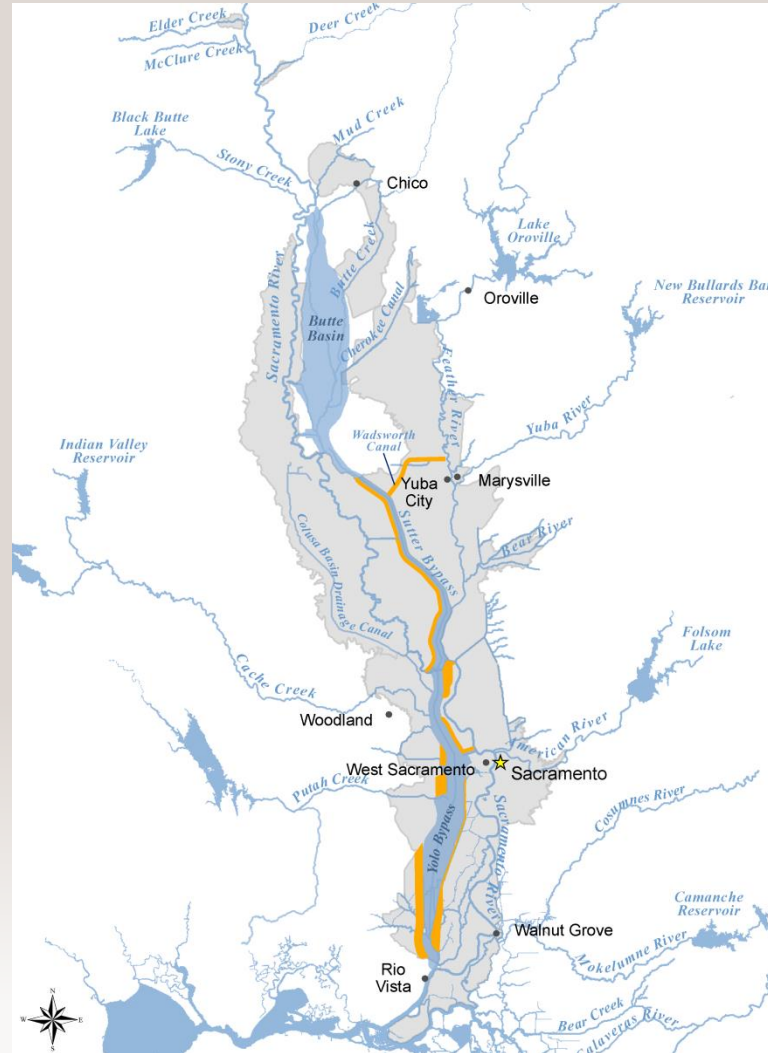
- Reduce future stage increases
- Maintain 200-year level of protection with projected sea level rise and climate change
- Illustrates the volume of storage needed in both the watersheds and overall system



Sacramento Basin

Expand and Extend Bypass Approach

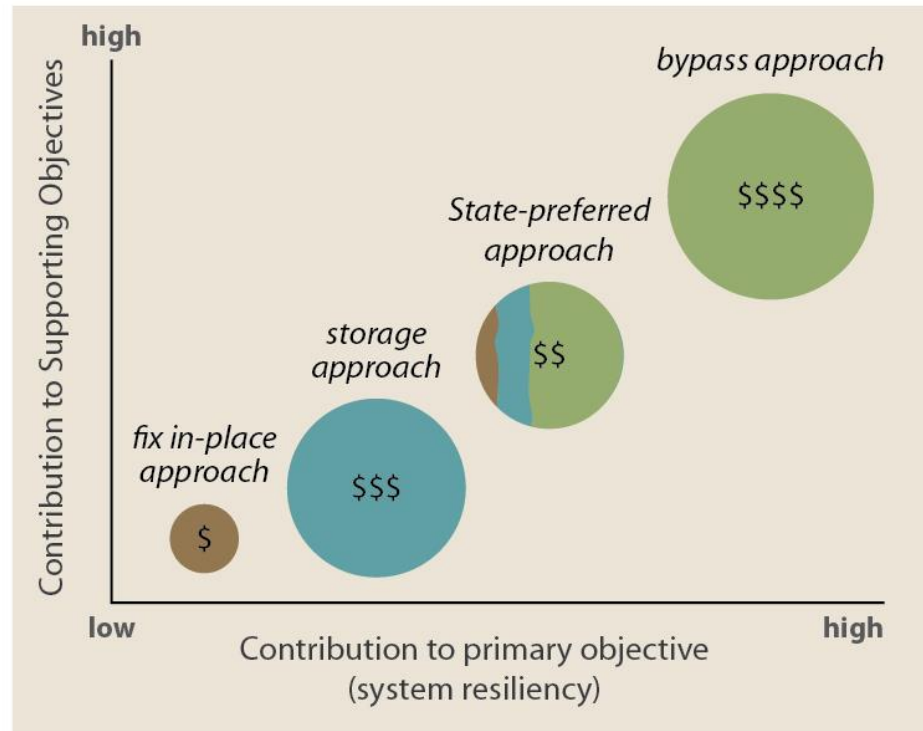
- Maximum expansion of Sutter and Yolo bypasses
- New Feather River bypass
- Convey 100-year flows through bypasses (except 200-year through urban)
- Maintain level of protection with projected sea level rise and climate change



Sacramento River Basin

Identifying the State-Preferred Approach

A **State-Preferred Approach** that combines the best of each approach is needed



Capital Investment vs. Benefits

Conceptual approaches for improving system resiliency in the Sacramento Basin

San Joaquin River Basin

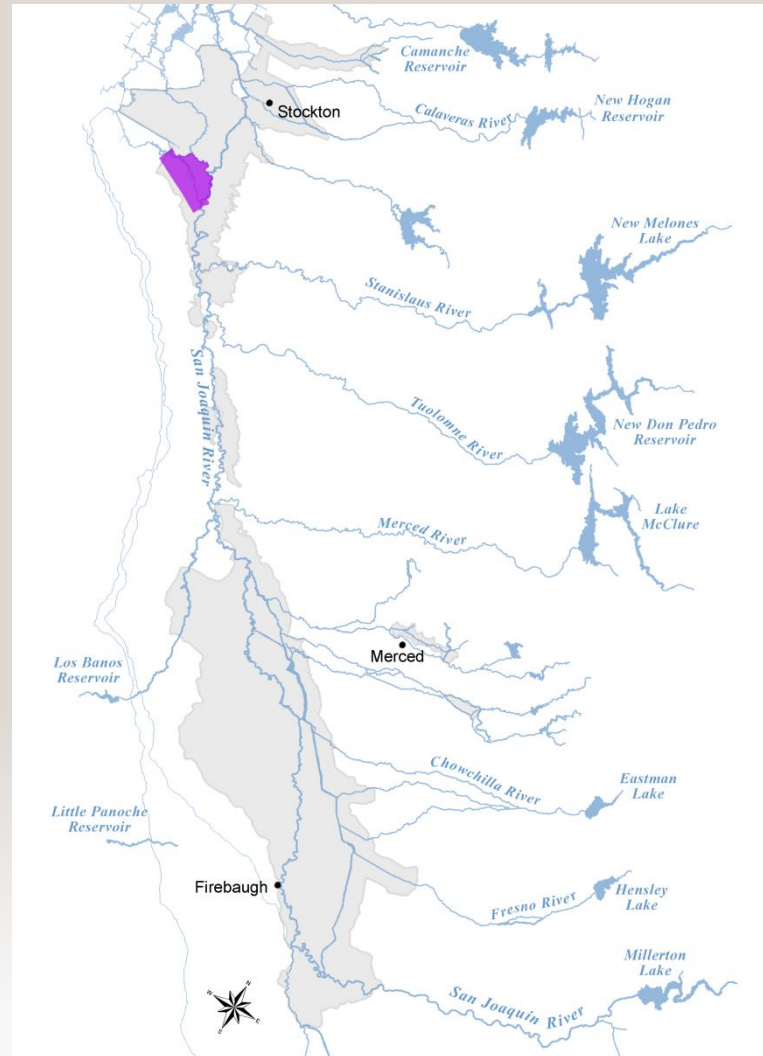
Paradise Cut Bypass Approach

Chapter

2

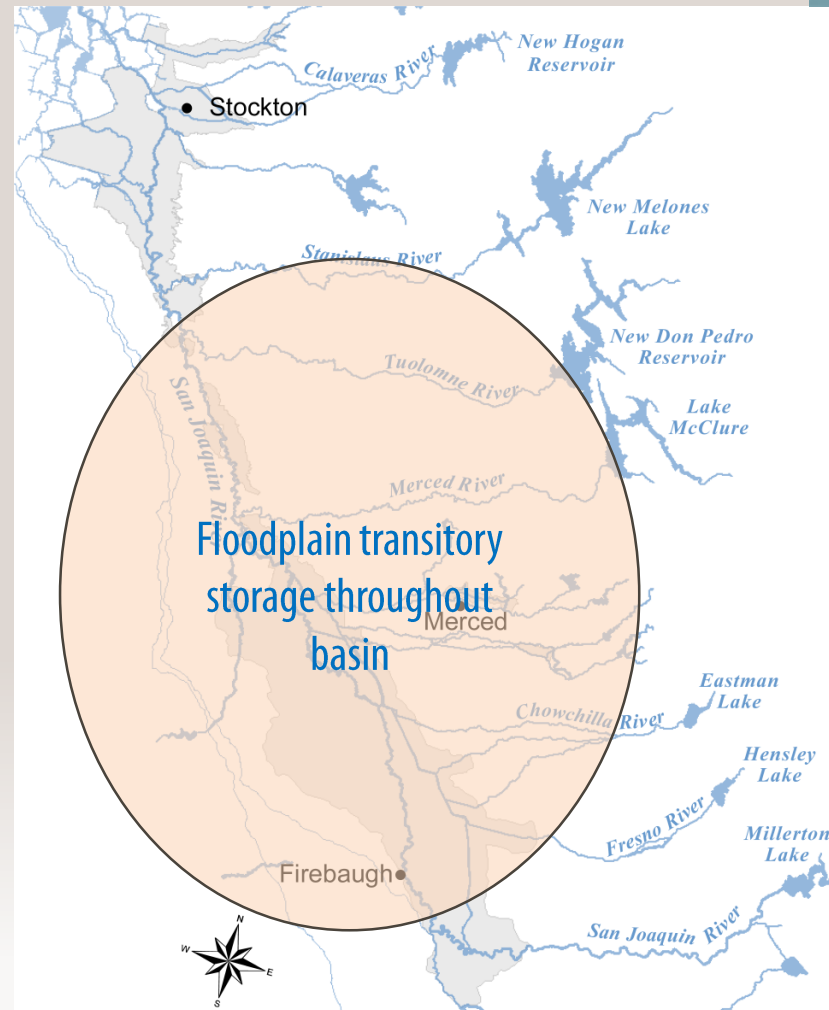
Converging

- Paradise Cut bypass expansion
- Conveys ~28,000 cfs in a 200-year flood event



San Joaquin River Basin Floodplain Transitory Storage Approach

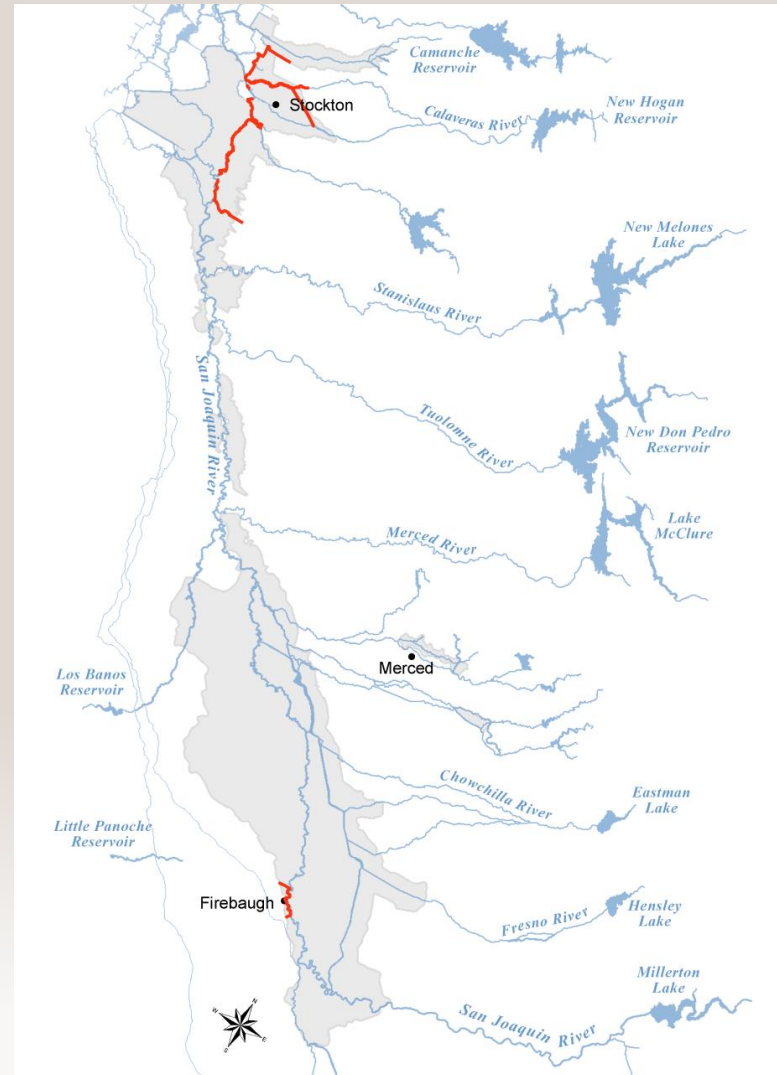
- Designed overtopping in some areas to reduce stages downstream



San Joaquin River Basin

Raise and Fix Levees Approach

- Strengthen and raise levees in high risk areas
- Achieve and maintain 200-year and 100-year level of protection with projected sea level rise and climate change



San Joaquin River Basin

Upstream Storage Approach

Upstream storage to address projected climate change:

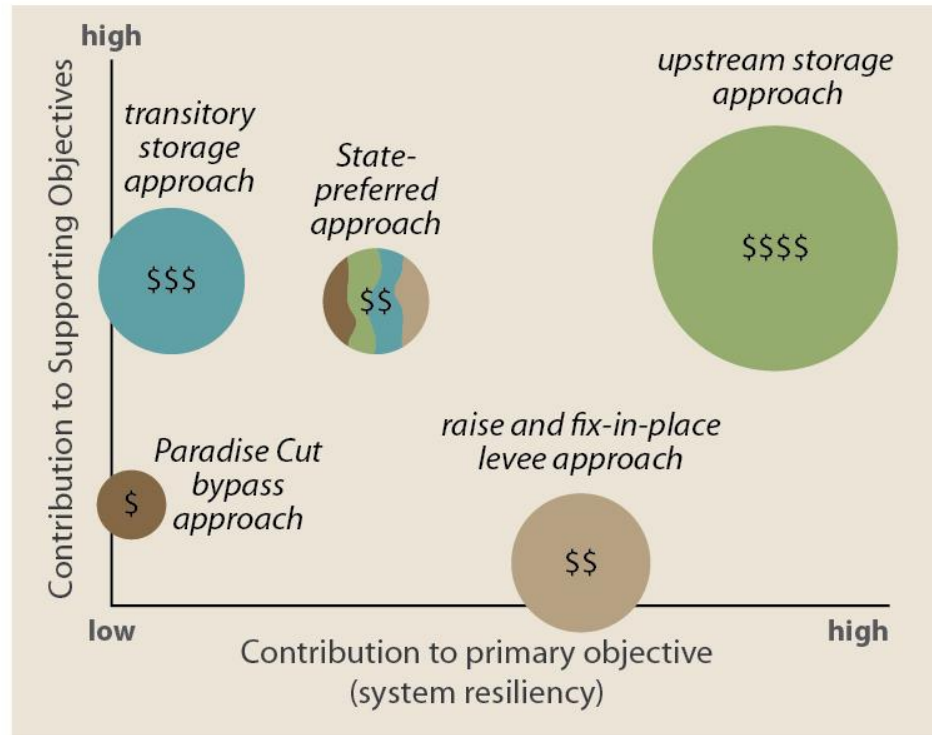
- Reduce future stage increases
- Maintain 200-year level of protection



San Joaquin River Basin

Identifying the State-Preferred Approach

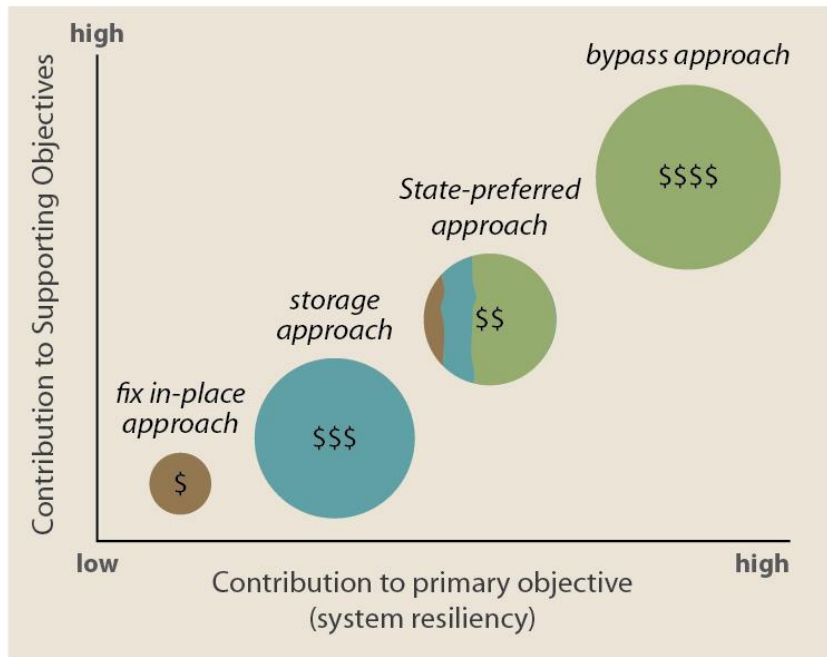
A **State-Preferred Approach** that combines the best of each approach is needed



Capital Investment vs. Benefits

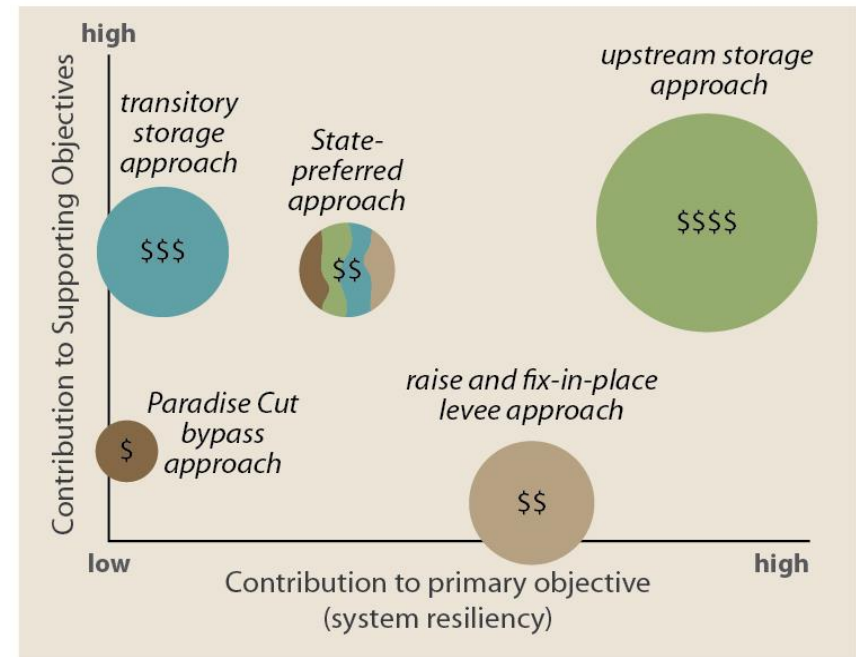
Conceptual approaches for improving system resiliency in the San Joaquin Basin

Identifying the State-Preferred Approaches



Capital Investment vs. Benefits

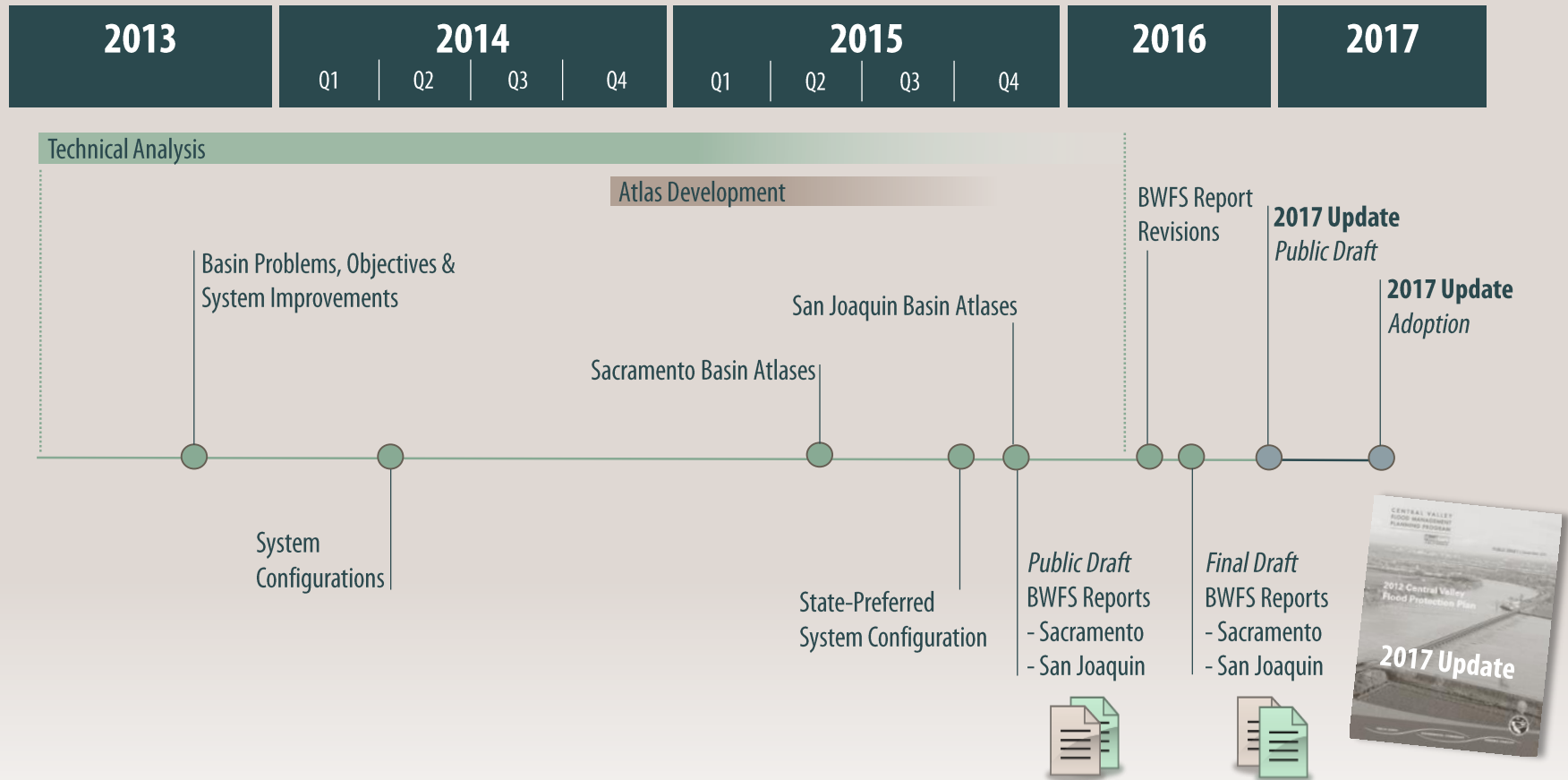
Conceptual approaches for improving system resiliency in the **Sacramento Basin**



Capital Investment vs. Benefits

Conceptual approaches for improving system resiliency in the **San Joaquin Basin**

Where Are We in the BWFS Process?

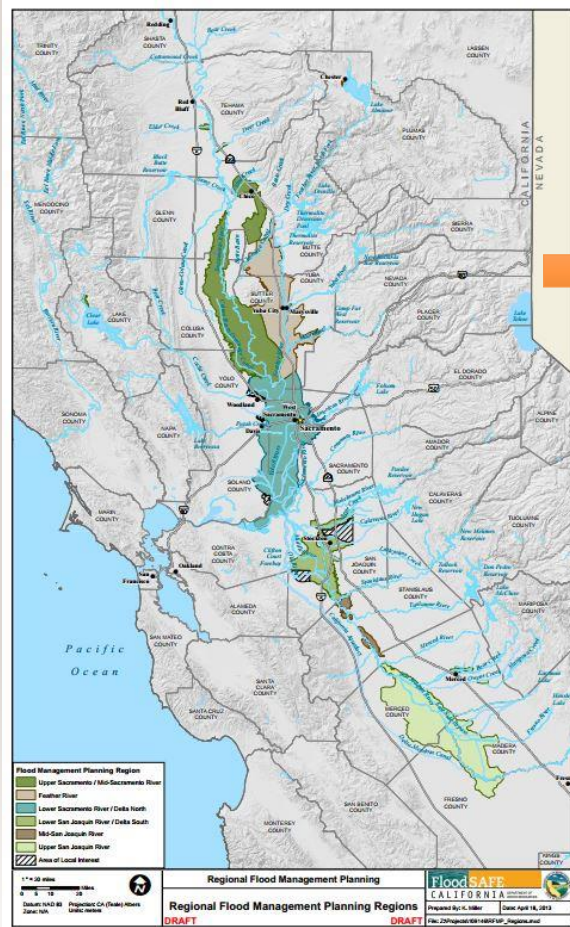


Where We Are

RFMP Phase 1 Content Review



One Process, Many Activities



CVFPP Assessment

- BWFS System Performance Analysis
- RFMP Regional Visions and Priorities
- Conservation Strategy
- O&M
- Safety & Risk
- Climate Change
- Long-term Economic Consequences of Flooding
- USACE Feasibility Studies

006

Purpose and Value of Regional Planning

Chapter
2

Converging

Chapter
3

System
Management

- Regional Planning provides greater level of detail necessary to:
 - Identify and describe potential systemwide improvements
 - Better define site-specific flood improvement needs
 - Identify regional priorities and challenges
 - Identify regional and local support needs for implementation



RFMP Content Review Activities

Chapter

2

Converging

Chapter

3

System
Management

1. **DWR/RFMP Listening Tour**
2. **Review of Regional Plans**
3. **Review of Projects Identified in Regional Plans**
4. **Continued Discussions and Dialogue – *Ongoing***

February/March 2015

DWR/RFMP Listening Tour

Chapter
2

Converging

Chapter
3

System
Management



- Series of DWR/ RFMP meetings planned
- Opportunity to:
 - Enhance DWR's understanding of regional challenges, opportunities and priorities
 - Discuss regional plans and RFMP integration into 2017 Update and future planning
 - View proposed project sites
 - See region "through RFMP eyes"
 - Continue open dialogue

Review of Regional Plans

What are we looking for?

- **Consistency**
 - Scope of Phase 1 RFMPs
 - CVFPP priorities
- **Detail About Regional Needs**
 - Proposed regional flood improvements, management actions, policy recommendations
- **Trends**
 - Commonality between regions' opportunities/challenges, priorities and management actions
- **Integration Opportunities**
 - 2017 Update and future planning
 - Identify how regional improvements add to overall system performance



Regional Plans – Initial Findings

Sacramento River Basin RFMPs

- Trends:
 - Significant agricultural land use
 - Plans have project prioritization
 - Plans focus on potential for multi-benefit projects
 - Focus on regional/statewide projects (reservoirs, bypasses)
- Main concerns:
 - Levee performance and certification
 - O&M/Permitting inconsistencies and constraints
 - Insufficient funding for repairs/improvements
 - NFIP rates

Regional Plans – Initial Findings

San Joaquin River Basin RFMPs

- Trends:
 - Significant agricultural land use
 - Population centers: Stockton, Tracy, Merced
 - Sizeable DAC presence
 - Projects are smaller, more localized in scale (levees)
 - Plans have multi-step, tiered project prioritization
- Main concerns:
 - Levee performance (subsidence, seepage and aging infrastructure) and certification
 - O&M/Permitting inconsistencies and constraints
 - Insufficient funding for repairs/improvements
 - Emergency management

Review of Projects Identified in Regional Plans

What are we looking for?

- **Project Specifics**
 - Benefits (local, inter-regional, system-wide) and timing
 - Anticipated costs and potential funding source(s)
- **Trends**
 - Commonalities between projects and regional needs
 - Opportunities for multiple-benefit projects
- **Bundling Opportunities**
 - Opportunities to strategically combine projects regionally, inter-regionally and system-wide
- **Linkage to State Priorities**



Regional Projects – Initial Findings

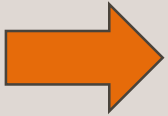
Regional Plan	Total Number of Projects	Percentage of Projects <u>without</u> Estimated Costs	Total Estimated Project Costs, in billions
Feather River	98	12%	\$2.2
Upper/Mid-Sacramento River	760	N/A	\$4.3
Lower Sacramento River and Delta North	130	24%	\$3.6
Lower San Joaquin River and Delta South	137	0%	\$3.0
Mid-San Joaquin River	37	0%	\$0.3
Upper San Joaquin River	88	13%	\$1.7
TOTAL	1,250		\$15.1

Note: Results based on preliminary reviews of the RFMPs.

Regional Projects – Initial Findings

- **Bundling Opportunities**

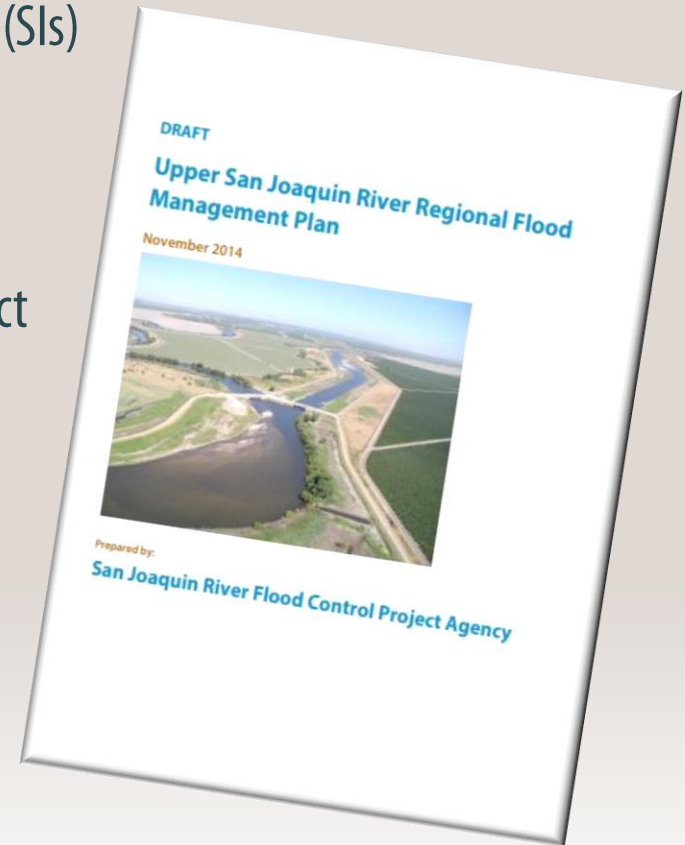
- Opportunities to strategically combine projects regionally, inter-regionally and system-wide



**Example: Upper San Joaquin River Regional Flood Management Plan
Multi-Benefit Project Identification – Jeremy Thomas, CH2M HILL**

USJR RFMP System Improvement Development

- Project proponents submitted system improvements (SIs)
- Range from well defined to conceptual ideas
- Team worked with project proponents to refine project descriptions and define potential benefits



Conservation Strategy Integration

USJR RFMP used the Conservation Strategy to:

- Understand regional ecological needs, priorities and opportunities
- Identify and develop regional multi-benefit projects consistent with CS measurable objectives
- Qualitatively measure the relative ecological benefits associated with system improvements



Multi-Benefit Evaluation Process

- System improvements evaluated using four high-level objectives:
 - Public Safety
 - **Environmental Stewardship**
 - Economic Stability
 - Regional Issues
- Stewardship criteria derived directly from Conservation Strategy measurable objectives



Environmental Stewardship Evaluation Criteria

Environmental Stewardship System Improvement Category			
Feature/Benefit	Low=1	Medium=5	High=10
Increased Flood Inundation - Sustained Spring Flows	Increase the total area of floodplain inundation during sustained spring flows (i.e. between March 15 and May 15 and for no less than 7 days) by a net increase of less than 5% compared to existing conditions	Increase the total area of floodplain inundation during sustained spring flows (i.e. between March 15 and May 15 and for no less than 7 days) by a net increase of between 5% and 50% compared to existing conditions	Increase the total area of floodplain inundation during sustained spring flows (i.e. between March 15 and May 15 and for no less than 7 days) by a net increase of greater than 50% compared to existing conditions
Increased Flood Inundation - 2 Yr. Flows	Increase the total area of floodplain inundation during 50 percent chance flows by a net increase of less than 10% compared to existing conditions	Increase the total area of floodplain inundation during 50 percent chance flows by a net increase of between 10% and 50% compared to existing conditions	Increase the total area of floodplain inundation during 50 percent chance flows by a net increase of greater than 50% compared to existing conditions
Increased Riverine Geomorphic Process - River Meander	Increase channel migration through a net increase of less than 1 acre of river meander potential.	Increase channel migration through a net increase of between 1 and 30 acres of river meander potential.	Increase channel migration through a net increase of more than 30 acres of river meander potential
Increased Riverine Geomorphic Process - Natural Bank	Increase the length of natural bank by a net increase of less than 10% compared to existing conditions	Increase the length of natural bank by a net increase of between 10% and 50% compared to existing conditions	Increase the length of natural bank by a net increase of greater than 50% compared to existing conditions
Extension and Continuity of SRA Coverage	Increase the extent of SRA cover by a net increase of less than 10% compared to existing conditions	Increase the extent of SRA cover by a net increase of between 10% and 50% compared to existing conditions	Increase the extent of SRA cover by a net increase of greater than 50% compared to existing conditions
Riparian Habitat Coverage	Increase the quantity of native riparian vegetation by less than 10% compared to existing conditions	Increase the quantity of native riparian vegetation by a net increase of between 10% and 50% compared to existing conditions	Increase the quantity of native riparian vegetation by a net increase of greater than 50% compared to existing conditions
Riparian Habitat Connectivity	Median riparian vegetation patch size increases by less than 10% compared to existing conditions	Median riparian vegetation patch size increases by a net increase of between 10% and 50% compared to existing conditions	Median riparian vegetation patch size increases by a net increase of greater than 50% compared to existing conditions
Marsh Habitat Coverage	Increase the quantity of native marsh / wetland vegetation by less than 10% compared to existing conditions	Increase the quantity of native marsh / wetland vegetation by a net increase of between 10% and 50% compared to existing conditions	Increase the quantity of native marsh / wetland vegetation by a net increase of greater than 50% compared to existing conditions

EXAMPLE

Multi-Benefit Evaluation Process

- Where projects scored well across more than one category, indicates potential for achieving multiple benefits
- Where projects ***did not*** score well across more than one category, indicates potential for combining with other projects or redefining / expanding project to include more benefits
- Allows preliminary understanding of how to 'mix and match', modify or group projects to respond to funding opportunities

USJR RFMP Multi-Benefit Opportunities

- Washington Ave / Redtop Subsidence Solution
- City of Firebaugh
- Great Valley Grasslands State Park
- USFWS transitory storage projects
- Fins & Feathers Forever (FX) off-channel seasonal wetlands pilot projects
 - Three Rivers Ranch
 - Cinnamon Slough
 - Sunrise Ranch
- San Joaquin River Restoration Program



RFMP: Moving from Phase 1 to Phase 2

Builds on success of Phase 1, focusing on:

- **Project management**
- **Coordination** – Promotion of regional collaboration with BWFS and CVFPP processes
- **Communications and Engagement** – Coordination with local landowners, stakeholders and public interest groups
- **Regional Governance** – Establish regional governance bodies to lead and effectively manage grant funds and flood management activities
- **Institutional Barriers** – Work with local, state and federal agencies to assess and develop strategies to overcome institutional barriers (permitting, flood insurance, sustainable financing, etc.)

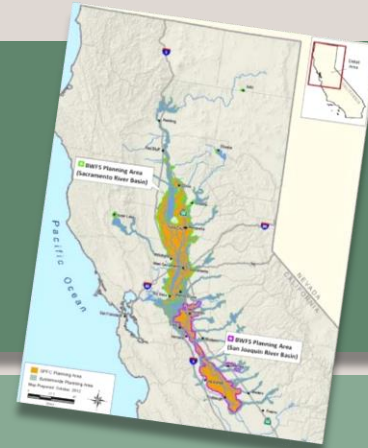
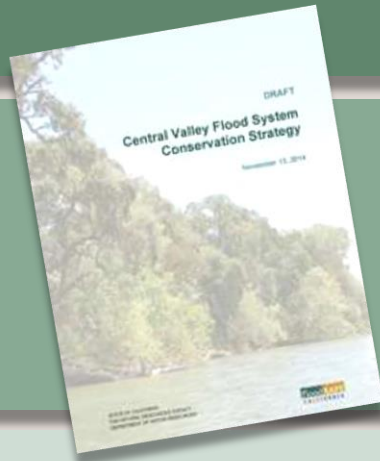
RFMP Phase 2 Update

General Approach

- **Strengthen Integration of Plans** – Near-term interactions focused on RFMPs integration into 2017 CVFPP Update
- **Recognizing Regional Variations** – Discussions will evolve in different ways for each region (i.e. no fixed agendas or set sequence of interactions)
- **Continued Local Engagement** – Recognize iterative nature of planning process, while educating local authorities on value of plans in securing future financing at all levels
- **Understanding Roles & Responsibilities** – Ability to articulate responsibilities and constraints is essential to strengthening collaboration between local, state, federal and private stakeholders in managing flood waters in the Central Valley

2017 CVFPP Integration

BWFS Preliminary Technical Work



Conservation Strategy Guidance

Regional Visions & Priorities



Where We're Going

Long-Term OMRR&R Workgroup Overview

Long-Term OMRR&R Workgroup Overview

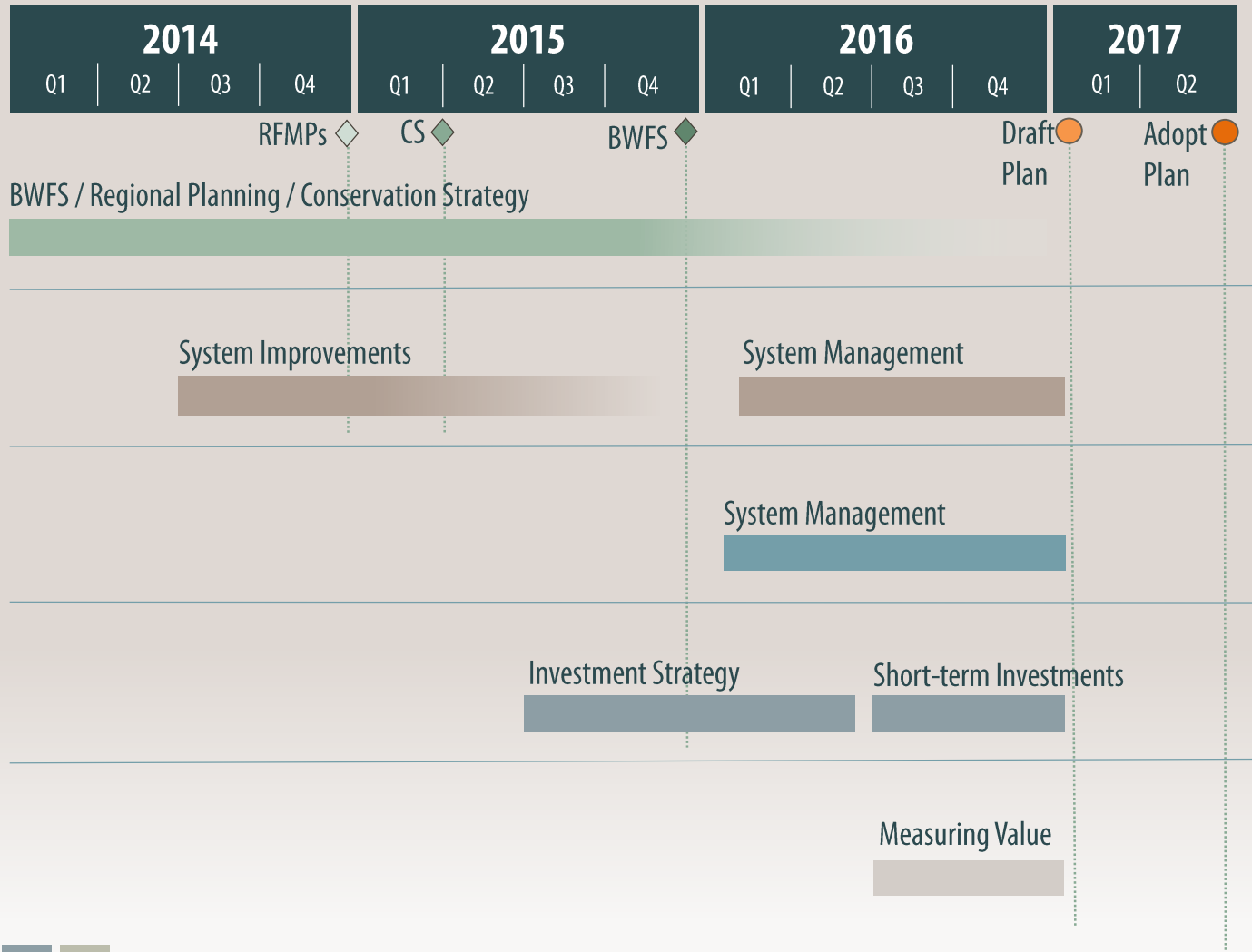
- Workgroup started in late 2013
- Charged with describing the “true costs” of Operation and Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) in the Central Valley
- Members from:
 - Central Valley Flood Planning Office
 - Flood Maintenance Office
 - Hydrology and Flood Operations Office
 - FloodSAFE Environmental Stewardship and Resources Office (FESSRO)
 - Statewide Infrastructure Investigations Branch
 - Consultants



Long-Term OMRR&R Workgroup Effort

- Developing unit and overall cost assumptions for OMRR&R activities for levees, channels and structures
- Addressing costs for environmental compliance/mitigation requirements in our assumptions
- Providing recommendations to support improved OMRR&R (including necessary next steps)
- Draft Technical Memorandum to be presented to Coordinating Committee in March 2015

CVFPP Progression (as of February 2015)



Proposed Future CVFPP Updates

Regular CVFPB, Coordinating Committee and public updates planned:

Venue	Date	Proposed Topic
CVFPB Meeting	February 27, 2015	CVFPP Update – RFMP Content Review, Preliminary BWFS Approaches
Coordinating Committee Meeting	March 25, 2015	O&M Workgroup results

2017 Central Valley Flood Protection Plan Update

February 25, 2015

Presented by:

Michael Mierzwa, P.E.

Michael.Mierzwa@water.ca.gov

Lead Flood Management Planner

California Department of Water Resources



2017 ROADMAP

